

Hubbard (Le Roy.)

SOME POINTS IN THE EARLY DIAGNOSIS
OF
VERTEBRAL TUBERCULOSIS.

BY
LE ROY W. HUBBARD, A.M., M.D.,
OF HARLEM, N. Y.



FROM
THE MEDICAL NEWS,
October 22, 1892.

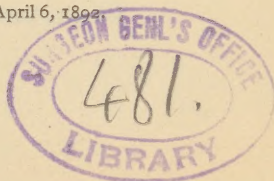
[Reprinted from THE MEDICAL NEWS, October 22, 1892.]

**SOME POINTS IN THE EARLY DIAGNOSIS OF
VERTEBRAL TUBERCULOSIS.¹**

BY LE ROY W. HUBBARD, A.M., M.D.,
OF HARLEM, N. Y.

PERHAPS an apology is due for presenting so old a subject as Pott's disease of the spine, or, as I prefer to call it, vertebral tuberculosis. But my excuse is twofold: first, the extreme importance of the subject itself; and secondly, the fact that so many cases present themselves to me in both dispensary and private practice, with marked deformity, which have been treated for weeks and months by various physicians, without the true nature of the trouble having been suspected. When one sees a case of caries of the vertebræ in the dorsal region, that has been treated for six months as a case of dyspepsia, because the child complained of pain in the epigastrium, until finally the parents themselves discovered the projection; or still another with an abscess as large as a good-sized orange projecting in the lumbar region, that has been treated for lumbago, there is a feeling that a little more light on the subject, even candle-light, may not be wasted. The two cases referred to were not in the hands of ignorant men, but in those of well-posted general practitioners, one of whom has a large hospital experience.

¹ Read before the Harlem Medical Association, April 6, 1892.



Often a mistake is made, as I think, in these cases, from a lack of thorough and careful examination. All cases in which there is the slightest suspicion of possible disease of the spine should be examined most carefully. In my opinion, the physician who does not strip and examine from head to foot a child that is brought to him with a history of persistent pain or peculiarity of attitude or gait is guilty of criminal negligence. It is just such superficial and careless work in the past that has contributed to the large number of deformed and crippled beings that constitute a crying reproach to our profession.

It is an easy matter to diagnosticate vertebral tuberculosis when there is a prominent deformity of the back or when an abscess is present; but when that time has come, great destruction of tissue has taken place, and the chances for a favorable result from treatment are greatly diminished.

I grant that it is often extremely difficult to make a positive diagnosis in the early stages of the disease, and that men of experience sometimes err; but the disease is not of such a nature as to require a hasty opinion. Plenty of time can be taken to study and watch the case, and if the symptoms are suspicious, keep it under observation. Don't, I beg, dismiss it in an off-hand way, saying to the parents that it is probably "rheumatism or growing-pains."

The points that I shall try to bring out in this paper I do not claim as original. They represent the result of the instruction and experience obtained during the past eight years in observing a large number of cases at the New York Orthopedic Hospital and Dispensary.

Before taking up the subject proper of my paper, I desire to say a few words in regard to a term that

I shall have occasion to use several times, and which seems to be only imperfectly understood and appreciated by the profession in general. I refer to reflex muscular spasm, and consider it the one most important symptom not only of spondylitis, but of chronic disease of the other joints in the early stage. By it I mean a tonic spasm or contraction of all of the muscles in relation to a diseased joint, by which Nature endeavors as much as possible to protect the joint from the traumatism of motion. It is present only in those muscles that act upon the diseased articulation or vertebræ ; it is almost without exception an expression of bone-inflammation ; it is the first symptom to appear, and persists until complete healing has taken place. It can be discovered in two ways: sometimes by the rigidity of the muscles appreciable to the touch, but more surely by an attempt to move the joint involved.

In some cases in which the disease is extensive or acute, the slightest attempt at motion is met with resistance, and you can feel the muscles quiver under your fingers, while the patient suffers no pain if the limb is handled carefully ; in others a certain range of motion is allowed with perfect freedom, but a point is always reached where the muscles say, " Thus far and no farther shalt thou go." That this resistance is purely reflex can be proved by the administration of an anesthetic, when motion will be perfectly free. It is difficult to describe just the sensation which this condition gives to the examiner, and it requires some experience to differentiate it from the voluntary resistance of a frightened and crying child.

Passing now to the direct subject of my paper, I will first consider the history of the case as an element in the early diagnosis. This is generally

mentioned in text-books as quite important, but my experience has taught me to place very little reliance upon it. There can be scarcely a question in the mind of anyone who has studied the recent investigations in the pathology of vertebral caries that the process is tuberculous. But this does not imply that the child must necessarily have had tuberculous ancestors, or previously have shown evidence of ill-health. It is true that close questioning will probably reveal some cases of tuberculosis on one or the other side of the family, but the same is no doubt true of children that have no disease of the vertebræ. The sources of infection by the tubercle-bacillus are so varied and numerous that there is no necessity for seeking a further direct cause.

Traumatism also does not play the exclusive part supposed by some authors, and it is uncommon at the dispensary to obtain a history of any severe injury to the spine. Yet, in all probability traumatism is in most cases the direct predisposing cause of the development of the tuberculous inflammation; but it is a traumatism so slight as to produce no impression on the parents' minds, or as not to cause the child to suffer pain at the time.

In my opinion, a slight but oft-repeated traumatism is a more important factor than a single severe injury. Though the injury may be slight, yet it is sufficient to cause an extravasation in the highly vascular structure of the body of a vertebra, which forms a home for the lodgment of tubercle-bacilli, which then begin their destructive process. But it is usually many weeks after the injury that any symptoms are noticed, for the action of these organisms is exceedingly slow. Therefore, the history of tuberculosis in the family and of a distinct

traumatism is of value when obtained ; but the absence of both, with the presence of decided symptoms, should have no influence in determining the diagnosis.

As a matter of fact, in the early stage of vertebral caries, as well as in chronic disease of the other joints, the presence or absence of any one symptom is not sufficient to determine the true nature of the trouble. It is only by a careful grouping of symptoms and objective signs that a positive conclusion can be arrived at, and these latter are in children much more important than either the history or subjective symptoms.

For clinical purposes we may divide the spinal column into three regions, differing somewhat from the usual anatomic division. The first consists of the cervical and upper three dorsal vertebræ ; the second extends from the fourth to the tenth dorsal, inclusive ; and the third comprises the remainder of the column.

The early signs of disease will vary greatly in accordance with the region in which it is situated. The upper region is the one of greatest range of motion ; numerous and powerful muscles are either attached to the vertebræ themselves or pass up on either side to attach the head to the trunk and assist the spine in giving the former firm support. We might naturally expect, therefore, that inflammation of the vertebræ in this region would call very early upon these muscles for protection against motion and traumatism, and this we find to be the case. As a rule, the first symptom or sign noticed by the parents is that the child carries its head stiffly, and frequently places one hand under the chin for support, complaining perhaps of being

tired, but not of actual pain. There may be no deformity, and the head may be held erect, but if the disease be situated high up, involving the first, second, or third vertebra, and the child is asked to look to the right or left, the whole body will be turned to accomplish the act.

If the inflammation is further down, rotation may be easily performed, but flexion and extension will be either *nil* or greatly limited. In many cases there is deformity, the head being twisted to one side or the other, in a position very much resembling that of torticollis.

So close is the resemblance often to this disease that many cases of caries have been treated with liniments, etc., and cases are on record in which the muscles have been divided. A point of difference is that in torticollis the chin is turned away from the contracted side, while in Pott's disease the reverse is the case. In some cases, particularly in young babies, the head is thrown back in extreme extension, and is rigidly held in that position.

In any of these cases, whether deformity is present or not, if the trunk is fixed and an attempt is made to move the head in all directions, sometimes at once, and in all cases before normal motion is completed, there will be resistance to further motion, and the sensation of a spasm of the muscles will be felt, while an expression of apprehension will pass over the child's face, even though no actual pain is suffered.

Placing one hand under the chin and the other under the occiput, giving firm support, and then making gentle traction in the line of deformity, will usually give relief.

Among older children there is sometimes a com-

plaint of pain in the back of the neck and head, but this is not constant, and a careful examination will generally reveal a slight projection or thickening around the diseased vertebræ, showing that the inflammation has existed for some time. The projection into the pharynx, and difficulty in deglutition, which in some text-books are pointed out as important symptoms, I have seldom found, and then only at a late stage of the disease.

It is in the second region that we find the greatest difficulty in making an early diagnosis as well as in carrying out efficient treatment. This portion of the spine, locked by firm attachments to the ribs, possesses the least mobility, and hence we cannot depend upon early manifestations of reflex spasm in the muscles. For this reason, we seldom see cases of disease in this locality before some deformity presents in the slight projection of one or more spinous processes. There are, however, certain well-marked early signs to which I wish to call attention.

A stiffness of carriage, with a tendency to hold the spine very erect, coupled with a disinclination on the part of the child to engage in active sports, is frequently noticed. Pain in the epigastrium, or anterior portion of the chest, is a frequent sign of disease in this second region, owing to pressure on the roots of the nerves, and a persistent pain in these regions should always call for a thorough examination of the spine. If the child is stripped and carefully watched during respiration, it will be noted that the respiratory movements are largely abdominal, the muscles of the chest being held quite rigid in order to prevent motion of the ribs as much as possible.

Where the disease is limited to one vertebra, a marked difference in the motion of the ribs attached to it, as compared with that of the other ribs, is often observed. In young children a grunting respiration is strongly indicative of disease of the spine in this region. Lateral pressure on the chest at the suspected point frequently causes pain.

In a certain proportion of cases there are no symptoms of a subjective character, and the discovery of the kyphosis by the mother is the first intimation of any trouble. For this reason it is a wise measure to instruct mothers to examine the backs of their children at least once a week.

But the presence of deformity is not always proof-positive of disease. Not long ago a child, about three years of age, was brought to the dispensary by its father, who had discovered a sharp projection in the mid-dorsal spine. There was no history of injury, the child was apparently well, complained of no pain, and played about as other children did. When the little girl was stripped, as characteristic a kyphosis as is usually seen in the early stage of Pott's disease, was plainly visible. It seemed to be confined to the spinous process of one vertebra. Careful examination, however, showed no muscular rigidity, the ribs moved freely, the spine could be flexed and extended, and there was no stiffness in walking. From the absence of these symptoms I was inclined to be doubtful, in spite of the kyphosis. The child was seen by others of the staff, and at different times, and finally a diagnosis was agreed upon. An apparatus was ordered, and while it was being made the child played about as usual. At the end of about two weeks the father was notified to come for the brace. He did so; the child was stripped

and placed upon a table, but to my utter astonishment the kyphosis had entirely disappeared. What it was or what became of it I cannot say.

When we reach the last division of the spine we find a region of mobility exceeded in degree only by the cervical region.

It is natural to expect, therefore, to have the presence of disease here indicated by symptoms referable to the muscles acting upon this portion of the spine. We find this to be the case. The muscles attached to the lumbar and lower dorsal vertebræ are all put in the condition which I have described as reflex spasm. The muscles become rigidly contracted, and hold the spine in a position to give it the greatest possible protection from traumatism. This is apparent to even a casual observer, and the mother will often say that she has noticed for some time that the child has held its back stiff in walking, has taken short steps, being particularly careful not to step down from small heights quickly, or to go over rough places, and if possible to avoid them. When, too, it stoops to pick up various articles, it does so in a peculiar manner. Instead of bending over so that the spine is flexed, it is held rigid, and the movement is executed by flexion of the knees. To regain the erect posture usually one hand is placed upon the thigh. This movement is very characteristic, and when present caries of the lumbar vertebræ should always be suspected.

Examining the child in the erect position, no deformity may be noticed, but, owing to the rigidity and spasm of the lumbar muscles, it will be impossible for the child to bend forward while holding the knees straight. After this examination, the

child should be placed in the prone position upon a flat surface, and with one hand upon the dorsal region and the other grasping the legs, attempt to hyperextend the spine. The normal spine in children is exceedingly flexible, and the pelvis can be raised to some height from the table and swung laterally; but if there is disease in the lumbar or lower dorsal region, reflex spasm is immediately excited, and no motion of the spine is permitted.

The next test consists in the attempt to extend both thighs with the pelvis held firmly upon the table. With disease present on one side or the other, complete extension of the thigh will be limited, and spasmodic contraction of the muscles will be felt. Care must be taken that the thigh is rotated inward during this test. The resistance is due to contraction of the psoas and iliacus muscles, which I consider as one. Their attachments are to the lower dorsal and lumbar vertebræ above, and to the lesser trochanter of the femur below, and their function is to flex and rotate the thigh outward. When the thigh is extended and rotated in, this muscle is made tense and immediately responds by spasm, if there is disease at its origin. The same sign is observed in hip-joint disease, and mistakes in diagnosis are sometimes made, particularly if the contraction is sufficient to cause flexion of the thigh to a position often seen in hip-joint disease, and producing a limp which resembles that of the latter disease very closely. But in hip-disease there is limitation of motion in all other directions also, while in spinal caries flexion, adduction, abduction, and rotation are nearly normal. This is a very valuable diagnostic sign of disease in the third region of the spine, but it is possible to find it with

some other conditions. There may be a psoas abscess independently of bone-disease, and consequent psoas contraction, but the spine will not be held fixed to resist motion in every direction. Acute disease of the pelvic organs may produce it, but generally the history and other symptoms will make the diagnosis clear. When psoas contraction is present, if the patient be placed upon the back with the knees elevated, deep pressure into the pelvis will generally show more or less fulness on the side of the contraction, with some tenderness. This may be slight and difficult to detect, or there may be evidence of a distinct tumor, with deep fluctuation.

Occasionally a lateral deviation of the spine is noted, without any kyphosis being present. In such a case it is possible to make the mistake of diagnosing lateral curvature; but the rigidity of the spine and the psoas contraction, which are not present in lateral curvature, make the diagnosis comparatively easy.

In young children we sometimes see a rachitic condition of the spine that closely resembles Pott's disease in this region. When the child stands or sits, there is a projection of the vertebræ that does not entirely disappear even when the prone position is taken. There is also some rigidity of the spine when an attempt to extend the spine is made, but there is no psoas resistance, and the marked evidence of rachitis in other portions of the body will be found. These backs are all benefited by support, so that an error in diagnosis is not serious.

Of course, we have the various manifestations of hysteria that give symptoms of disease in all of the regions, even to muscular rigidity and reflex spasm. The discrimination is often difficult, but in a sus-

pected case many and careful observations, under varying conditions, will generally clear up the diagnosis; in any event, in a doubtful case it is better to be on the safe side, and treat it as one of real disease.

It may be noticed that I have not mentioned a symptom usually found in all the text-books, and considered very important, viz., tenderness on pressure or percussion over the spines of the affected vertebræ. I have omitted it purposely, because I consider it a symptom of no value whatever. It is rarely present, and never in the early stages of the disease. In fact, when I see a case that presents a great amount of tenderness over the spine, I am generally positive that it is not Pott's disease, but spinal-cord irritation.

In older children and adults the pain produced by a sudden jar to the spine in stepping down quickly from a slight elevation, or rising on the toes and dropping suddenly upon the heels, is a valuable symptom quite early in the disease.

In concluding this paper, in which I have attempted to give only a few hints or suggestions in regard to diagnosis, I wish again to emphasize the importance of thorough and careful examination of cases that present any symptoms of spinal disease. If discovered sufficiently early, it is possible to effect a cure, with no appreciable deformity, even when the disease is located in the dorsal region.

The Medical News.

Established in 1843.

A WEEKLY MEDICAL NEWSPAPER.

Subscription, \$4.00 per Annum.

The American Journal

OF THE

Medical Sciences.

Established in 1820.

A MONTHLY MEDICAL MAGAZINE.

Subscription, \$4.00 per Annum.

COMMUTATION RATE, \$7.50 PER ANNUM.

LEA BROTHERS & CO.

PHILADELPHIA.